CLAIMS

1. A method of diagnosing PRC or a predisposition to developing PRC in a subject, comprising determining a level of expression of EphA4 in a patient derived biological sample, wherein an increase of said level compared to a normal control level of said gene indicates that said subject suffers from or is at risk of developing PRC.

2. The method of claim 1, wherein said increase is at least 10% greater than said normal control level.

3. The method of claim 1, wherein the expression level is determined by any one method select from group consisting of:
(a) detecting the mRNA of EphA4,
(b) detecting the protein encoded by EphA4, and
(c) detecting the biological activity of the protein encoded by EphA4.

4. The method of claim 1, wherein said level of expression is determined by detecting hybridization of EphA4 probe to a gene transcript of said patient-derived biological sample.

5. The method of claim 4, wherein said hybridization step is carried out on a DNA array.

6. The method of claim 1, wherein said biological sample comprises an epithelial cell.

7. The method of claim 1, wherein said biological sample comprises PRC cell.

8. The method of claim 7, wherein said biological sample comprises an epithelial cell from a PRC.

9. A method of screening for a compound for treating or preventing PRC, said method comprising the steps of:
a) contacting a test compound with a polypeptide encoded by EphA4;
b) detecting the binding activity between the polypeptide and the test compound;

and

c) selecting a compound that binds to the polypeptide.

10. A method of screening for a compound for treating or preventing PRC, said method comprising the steps of:

a) contacting a candidate compound with a cell expressing EphA4; and

b) selecting a compound that reduces the expression level of EphA4.

11. The method of claim10, wherein said cell comprises a prostate cancer cell.

12. A method of screening for a compound for treating or preventing PRC, said method comprising the steps of:

a) contacting a test compound with a polypeptide encoded by EphA4;

b) detecting the biological activity of the polypeptide of step (a); and

c) selecting a compound that suppresses the biological activity of the polypeptide in comparison with the biological activity detected in the absence of the test compound.

13. The method of claim12, wherein the biological activity is tyrosine kinase activity.

14. A method of screening for compound for treating or preventing PRC, said method comprising the steps of:

a) contacting a test compound with a cell into which a vector comprising the transcriptional regulatory region of EphA4 genes and a reporter gene that is expressed under the control of the transcriptional regulatory region has been introduced,

b) measuring the expression or activity of said reporter gene; and

c) selecting a compound that reduces the expression or activity level of said reporter gene, as compared to a level in the absence of the test compound.

15. A method of treating or preventing PRC in a subject comprising administering to said subject an antisense composition, said composition comprising a nucleotide sequence complementary to a coding sequence of EphA4.

16. A method of treating or preventing PRC in a subject comprising administering to

said subject a siRNA composition, wherein said composition reduces the expression of EphA4.

17. The method of claim 16, wherein said siRNA comprises a sense nucleic acid and an anti-sense nucleic acid of *EphA4*.

18. The method of claim 17, wherein the siRNA comprises a ribonucleotide sequence corresponding to a sequence consisting of SEQ ID NO: 10 as the target sequence.

19. The method of claim 18, said siRNA has the general formula 5'-[A]-[B]-[A']-3', wherein [A] is a ribonucleotide sequence corresponding to a sequence consisting of nucleotides of SEQ ID NO: 10.
[B] is a ribonucleotide sequence consisting of about 3 to about 23 nucleotides, and [A'] is a ribonucleotide sequence consisting of the complementary sequence of [A].

20. The method of claim 16, wherein said composition comprises a transfection-enhancing agent.

21. A method of treating or preventing PRC in a subject comprising the step of administering to said subject a pharmaceutically effective amount of an antibody or fragment thereof that binds to a protein encoded by EphA4.

22. A method of treating or preventing PRC in a subject comprising administering to said subject a vaccine comprising a polypeptide encoded by EphA4 or an immunologically active fragment of said polypeptide, or a polynucleotide encoding the polypeptide.

23. A method of treating or preventing PRC in a subject, said method comprising the step of administering a compound that is obtained by the method according to any one of claims 9-14.

24. A composition for treating or preventing PRC, said composition comprising a pharmaceutically effective amount of an antisense polynucleotide or siRNA against a EphA4 as an active ingredient, and a pharmaceutically acceptable carrier.

25. The composition of claim 24, wherein said siRNA comprises the nucleotide sequence consisting of SEQ ID NO: 10 as the target sequence.

26. A composition for treating or preventing PRC, said composition comprising a pharmaceutically effective amount of an antibody or fragment thereof that binds to a protein encoded by EphA4 as an active ingredient, and a pharmaceutically acceptable carrier.

27. A composition for treating or preventing PRC, said composition comprising a pharmaceutically effective amount of the compound selected by the method of any one of claims 9-14 as an active ingredient, and a pharmaceutically acceptable carrier.

28. A method for treating or preventing pancreatic cancer in a subject comprising administering to said subject a composition comprising a siRNA of *EphA4*.

29. The method of claim 28, wherein said siRNA comprises a sense nucleic acid and an anti-sense nucleic acid of *EphA4*.

30. The method of claim 28, wherein the pancreatic cancer is an pancreatic ductal adenocarcinoma (PDACa).

31. The method of claim 29, wherein the siRNA comprises a ribonucleotide sequence corresponding to a sequence consisting of SEQ ID NO: 10 as the target sequence.

32. The method of claim 31, said siRNA has the general formula 5'-[A]-[B]-[A']-3', wherein [A] is a ribonucleotide sequence corresponding to a sequence consisting of nucleotides of SEQ ID NO: 10.
[B] is a ribonucleotide sequence consisting of about 3 to about 23 nucleotides, and
[A'] is a ribonucleotide sequence consisting of the complementary sequence consisting of [A].

33. The method of claim 28, wherein said composition comprises a transfection-enhancing agent.

34. A double-stranded molecule comprising a sense strand and an antisense strand,

wherein the sense strand comprises a ribonucleotide sequence corresponding to a target sequence consisting of SEQ ID NO: 10, and wherein the antisense strand comprises a ribonucleotide sequence which is complementary to said sense strand, wherein said sense strand and said antisense strand hybridize to each other to form said double-stranded molecule, and wherein said double-stranded molecule, when introduced into a cell expressing the *EphA4* gene, inhibits expression of said gene.

35. The double-stranded molecule of claim 34, wherein said target sequence comprises at least about 10 contiguous nucleotides from the nucleotide sequence consisting of SEQ ID NO: 1.

36. The double-stranded molecule of claim 35, wherein said target sequence comprises from about 19 to about 25 contiguous nucleotides from the nucleotide sequence consisting of SEQ ID NO: 1.

37. The double-stranded molecule of claim 36, wherein said double-stranded molecule is a single ribonucleotide transcript comprising the sense strand and the antisense strand linked via a single-stranded ribonucleotide sequence.

38. The double-stranded molecule of claim 35, wherein the double-stranded molecule is an oligonucleotide of less than about 100 nucleotides in length.

39. The double-stranded molecule of claim 38, wherein the double-stranded molecule is an oligonucleotide of less than about 75 nucleotides in length.

40. The double-stranded molecule of claim 39, wherein the double-stranded molecule is an oligonucleotide of less than about 50 nucleotides in length.

41. The double-stranded molecule of claim 40, wherein the double-stranded molecule is an oligonucleotide of less than about 25 nucleotides in length.

42. The double-stranded polynucleotide of claim 41, wherein the double stranded molecule is an oligonucleotide of between about 19 and about 25 nucleotides in length.

43. A vector encoding the double-stranded molecule of claim 35.

44. The vector of claim 43, wherein the vector encodes a transcript having a secondary structure and comprises the sense strand and the antisense strand.

45. The vector of claim 44, wherein the transcript further comprises a single-stranded ribonucleotide sequence linking said sense strand and said antisense strand.

46. A vector comprising a polynucleotide comprising a combination of a sense strand nucleic acid and an antisense strand nucleic acid, wherein said sense strand nucleic acid comprises nucleotide sequence consisting of SEQ ID NO: 10, and said antisense strand nucleic acid consists of a sequence complementary to the sense strand.

47. The vector of claim 46, wherein said polynucleotide has the general formula

5'-[A]-[B]-[A']-3'

wherein [A] is a nucleotide sequence consisting of SEQ ID NO: 10; [B] is a nucleotide sequence consisting of about 3 to about 23 nucleotides; and [A'] is a nucleotide sequence complementary to [A].

48 A pharmaceutical composition for treating or preventing pancreatic cancer comprising a pharmaceutically effective amount of a small interfering RNA (siRNA) of *EphA4* as an active ingredient, and a pharmaceutically acceptable carrier.

49. The pharmaceutical composition of claim 48, wherein the siRNA comprises a nucleotide sequence consisting of SEQ ID NO: 10 as the target sequence.

50. The composition of claim 49, wherein the siRNA has the general formula
5'-[A]-[B]-[A']-3'
wherein [A] is a ribonucleotide sequence corresponding to a nucleotide sequence of SEQ ID NO: 10; [B] is a ribonucleotide sequence consisting of 3 to 23 nucleotides; and [A'] is a ribonucleotide sequence complementary to [A].